

## CLAIMS

1. A method of diagnosing breast cancer or a predisposition for developing breast cancer in a subject, comprising determining a level of expression of a breast cancer-associated gene in a patient-derived biological sample, wherein an increase or  
5 decrease in said sample expression level as compared to a normal control level of said gene indicates that said subject suffers from or is at risk of developing breast cancer.
2. The method of claim 1, wherein said breast cancer-associated gene is selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471, further wherein an increase in said sample expression level as compared  
10 to a normal control level indicates said subject suffers from or is at risk of developing breast cancer.
3. The method of claim 2, wherein said sample expression level is at least 10% greater than said normal control level.
4. The method of claim 1, wherein said breast cancer-associated gene is selected from  
15 the group consisting of the genes of BRC Nos. 176-373, 399-447, and 472-512, further wherein a decrease in said sample expression level as compared to a normal control level indicates said subject suffers from or is at risk of developing breast cancer.
5. The method of claim 4, wherein said sample expression level is at least 10% lower  
20 than said normal control level.
6. A method of claim 1, wherein said breast cancer is IDC.
7. The method of claim 6, wherein said breast cancer-associated gene is selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471, further wherein  
an increase in said sample expression level as compared to a normal control level  
25 indicates said subject suffers from or is at risk of developing IDC.
8. The method of claim 7, wherein said sample expression level is at least 10% greater than said normal control level.
9. The method of claim 6, wherein said breast cancer-associated gene is selected from the group consisting of the genes of BRC Nos. 472-512, further wherein a decrease in

said sample expression level as compared to a normal control level indicates said subject suffers from or is at risk of developing IDC.

10. The method of claim 9, wherein said sample expression level is at least 10% lower than said normal control level.

5 11. The method of claim 1, wherein said method further comprises determining the level of expression of a plurality of breast cancer-associated genes.

12. The method of claim 1, wherein gene expression level is determined by a method selected from the group consisting of:

(a) detecting mRNA of the breast cancer-associated gene,

10 (b) detecting a protein encoded by the breast cancer-associated gene, and

(c) detecting a biological activity of a protein encoded by the breast cancer-associated gene.

13 The method of claim 12, wherein said detection is carried out on a DNA array.

14 The method of claim 1, wherein said patient-derived biological sample comprises an  
15 epithelial cell.

15 The method of claim 1, wherein said patient-derived biological sample comprises a breast cancer cell.

16 The method of claim 1 wherein said patient-derived biological sample comprises an epithelial cell from a breast cancer cell.

20 17 A breast cancer reference expression profile comprising a pattern of gene expression of two or more breast cancer-associated genes selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512.

18 A breast cancer reference expression profile comprising a pattern of gene expression for two or more breast cancer-associated genes selected from the group consisting of  
25 the genes of BRC Nos. 123-169, 171-175, 374-398, 448-449, and 451-471.

19 A breast cancer reference expression profile comprising a pattern of gene expression for two or more breast cancer-associated genes selected from the group consisting of the genes of BRC Nos. 176-373, 399-447, and 472-512.

20 A method of screening for a compound for treating or preventing breast cancer, said

method comprising the steps of:

- a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512;
- 5 b) detecting the binding activity between the polypeptide and the test compound; and
- c) selecting the test compound that binds to the polypeptide.

21. A method of screening for a compound for treating or preventing breast cancer, said method comprising the steps of:

- 10 a) contacting a candidate compound with a cell expressing one or more marker genes, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512; and
- b) selecting the candidate compound that reduces the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 123-169, 171-175, 374-398, 448-449, and 451-471, or elevates the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 15 176-373, 399-447, and 472-512, as compared to a control.

22. The method of claim 21, wherein said cell comprises a breast cancer cell.

23. A method of screening for a compound for treating or preventing breast cancer, said method comprising the steps of:

- 20 a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512;
- b) detecting the biological activity of the polypeptide of step (a); and
- c) selecting the test compound that suppresses the biological activity of the polypeptide 25 encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 123-169, 171-175, 374-398, 448-449, and 451-471 as compared to the biological activity of said polypeptide detected in the absence of the test compound, or enhances the biological activity of the polypeptide encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 176-373, 399-447, and 30 472-512 as compared to the biological activity of said polypeptide detected in the absence of the test compound.

24. A method of screening for compound for treating or preventing breast cancer, said method comprising the steps of:

- a) contacting a candidate compound with a cell into which a vector, comprising the transcriptional regulatory region of one or more marker genes and a reporter gene that is expressed under the control of the transcriptional regulatory region, has been introduced, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512;
- b) measuring the expression or activity of said reporter gene; and
- c) selecting the candidate compound that reduces the expression or activity of said reporter gene when said marker gene is an up-regulated marker gene selected from the group consisting of the genes of BRC Nos. 123-169, 171-175, 374-398, 448-449, and 451-471, or that enhances the expression level of said reporter gene when said marker gene is a down-regulated marker gene selected from the group consisting of the genes of BRC Nos. 176-373, 399-447, and 472-512, as compared to a control.

25. The method of claim 20, wherein said breast cancer is IDC, said method comprises the steps of:

- a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 448-449 and 451-512;
- b) detecting the binding activity between the polypeptide and the test compound; and
- c) selecting the test compound that binds to the polypeptide.

26. The method of claim 21, wherein said breast cancer is IDC and said method comprises the steps of:

- a) contacting a candidate compound with a cell expressing one or more marker genes, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 448-449 and 451-512; and
- b) selecting the candidate compound that reduces the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471, or elevates the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 472-512, as compared to a control.

27. The method of claim 26, wherein said cell comprises an IDC cell.

28. The method of claim 23, wherein said breast cancer is IDC and said method comprises the steps of:

a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 448-449 and 451-512;

5 b) detecting the biological activity of the polypeptide of step (a); and

c) selecting the test compound that suppresses the biological activity of the polypeptide encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471, as compared to the biological activity of said polypeptide detected in the absence of the test compound, or enhances the biological activity of the polypeptide encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 472-512 as compared to the biological activity of said polypeptide detected in the absence of the test compound.

29. A method of claim 24, wherein said breast cancer is IDC and said method comprises the steps of:

15 a) contacting a candidate compound with a cell into which a vector, comprising the transcriptional regulatory region of one or more marker genes and a reporter gene that is expressed under the control of the transcriptional regulatory region, has been introduced, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 448-449 and 451-512;

20 b) measuring the expression or activity of said reporter gene; and

c) selecting the candidate compound that reduces the expression or activity of said reporter gene when said marker gene is an up-regulated marker gene selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471, or that enhances the expression level of said reporter gene when said marker gene is a down-regulated marker gene selected from the group consisting of the genes of BRC Nos. 472-512, as compared to a control.

30. A kit comprising a detection reagent which binds to (a) two or more nucleic acid sequences selected from the group consisting of the genes of BRC Nos. 123-169, 171-449, and 451-512, or (b) polypeptides encoded thereby.

30 31. An array comprising two or more nucleic acids which bind to one or more nucleic acid sequences selected from the group consisting of the genes of BRC Nos. 123-169, 171-

449, and 451-512.

32. A method of treating or preventing breast cancer in a subject comprising administering to said subject an antisense composition, said antisense composition comprising a nucleotide sequence complementary to a coding sequence selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471.

33. A method of treating or preventing breast cancer in a subject comprising administering to said subject an siRNA composition, wherein said siRNA composition reduces the expression of a nucleic acid sequence selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471.

34. The method of claim 33, wherein said siRNA comprises the sense strand comprising a nucleotide sequence selected from the group consisting of nucleotide sequences of SEQ ID NO: 25, 28 and 31.

35. A method for treating or preventing breast cancer in a subject comprising the step of administering to said subject a pharmaceutically effective amount of an antibody, or immunologically active fragment thereof, that binds to a protein encoded by any one gene selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471.

36. A method of treating or preventing breast cancer in a subject comprising administering to said subject a vaccine comprising (a) a polypeptide encoded by a nucleic acid selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471, (b) an immunologically active fragment of said polypeptide, or (c) a polynucleotide encoding the polypeptide.

37. A method for inducing an anti-tumor immunity, said method comprising the step of contacting with an antigen presenting cell a polypeptide, a polynucleotide encoding the polypeptide or a vector comprising the polynucleotide, wherein the polypeptide is encoded by a gene selected from the group consisting of BRC No. 123-169, 171-175, 374-398, 448-449, and 451-471, or the fragment thereof.

38. The method for inducing an anti-tumor immunity of claim 37, wherein the method further comprises the step of administering the antigen presenting cell to a subject.

39. A method of treating or preventing breast cancer in a subject comprising administering to said subject a compound that increases (a) the expression of a polynucleotide selected from the group consisting of the genes of BRC Nos. 176-373, 399-447, and 472-512 or (b) the activity of a polypeptide encoded thereby.

5 40. A method for treating or preventing breast cancer in a subject, said method comprising the step of administering a compound obtained by a method according to any one of claims 20-24.

41. A method of treating or preventing breast cancer in a subject comprising administering to said subject a pharmaceutically effective amount of an agent comprising (a) a  
10 polynucleotide selected from the group consisting of the genes of BRC Nos. 176-373, 399-447, and 472-512, or (b) a polypeptide encoded thereby.

42. The method of claim 32, wherein said breast cancer is IDC and said antisense composition comprises a nucleotide sequence complementary to a coding sequence selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471.

15 43. The method of claim 33, wherein said breast cancer is IDC and said siRNA composition reduces the expression of a nucleic acid sequence selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471.

44. The method of claim 43, wherein said siRNA comprises the sense strand comprising a nucleotide sequence selected from the group consisting of nucleotide sequences of  
20 SEQ ID NO: 25, 28 and 31.

45. The method of claim 35, wherein said breast cancer is IDC and said antibody or fragment thereof binds to a protein encoded by any one gene selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471.

46. The method of claim 36, wherein said breast cancer is IDC and said vaccine comprises  
25 (a) a polypeptide encoded by a nucleic acid selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471, (b) an immunologically active fragment of said polypeptide, or (c) a polynucleotide encoding the polypeptide.

47. A method for inducing an anti-tumor immunity against IDC, said method comprising the step of contacting with an antigen presenting cell a polypeptide, a polynucleotide  
30 encoding the polypeptide or a vector comprising the polynucleotide, wherein the

polypeptide is encoded by a gene selected from the group consisting of BRC No. 448-449 and 451-471, or the fragment thereof.

48. The method of claim 47, wherein the method further comprises the step of administering the antigen presenting cell to a subject.

5 49. The method of claim 39, wherein said breast cancer is IDC and said compound increases (a) the expression of a polynucleotide selected from the group consisting of the genes of BRC Nos. 472-512 or (b) the activity of a polypeptide encoded thereby.

50. The method of claim 40, wherein said breast cancer is IDC and said compound is obtained by a method according to any one of claims 25-29.

10 51. The method of claim 41, wherein said breast cancer is IDC, further wherein said agent comprises (a) a polynucleotide selected from the group consisting of the genes of BRC Nos. 472-512 or (b) a polypeptide encoded by thereof.

52. A composition for treating or preventing breast cancer, said composition comprising a pharmaceutically effective amount of an antisense polynucleotide or siRNA against a  
15 polynucleotide selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471.

53. The composition of claim 52, wherein said siRNA comprises the sense strand comprising a nucleotide sequence selected from the group consisting of nucleotide sequences of SEQ ID NO: 25, 28 and 31.

20 54. A composition for treating or preventing breast cancer, said composition comprising a pharmaceutically effective amount of an antibody or fragment thereof that binds to a protein encoded by a gene selected from the group consisting of the genes of BRC Nos.123-169, 171-175, 374-398, 448-449, and 451-471.

55. A composition for treating or preventing breast cancer, said composition comprising  
25 as an active ingredient a pharmaceutically effective amount of a compound selected by a method of any one of claims 20-24, and a pharmaceutically acceptable carrier.

56. The composition of claim 52, wherein said breast cancer is IDC and said polynucleotide is selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471.



57. The composition of claim 56, wherein said siRNA comprises the sense strand comprising a nucleotide sequence selected from the group consisting of nucleotide sequences of SEQ ID NO: 25, 28 and 31.
58. The composition of claim 54, wherein said breast cancer is IDC and said protein is encoded by a gene selected from the group consisting of the genes of BRC Nos. 448-449 and 451-471.
59. The composition of claim 55, wherein said breast cancer is IDC and said compound is selected by a method of any one of claims 25-29.
60. A method of screening for a compound for treating or preventing invasion of breast cancer, said method comprising the steps of:
- a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 374-447;
  - b) detecting the binding activity between the polypeptide and the test compound; and
  - c) selecting the test compound that binds to the polypeptide.
61. A method of screening for a compound for treating or preventing invasion of breast cancer, said method comprising the steps of:
- a) contacting a candidate compound with a cell expressing one or more marker genes, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 374-447; and
  - b) selecting the candidate compound that reduces the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 374-398, or elevates the expression level of one or more marker genes selected from the group consisting of the genes of BRC Nos. 399-447, as compared to a control.
62. The method of claim 61, wherein said cell comprises a breast cancer cell.
63. A method of screening for a compound for treating or preventing invasion of breast cancer, said method comprising the steps of:
- a) contacting a test compound with a polypeptide encoded by a polynucleotide selected from the group consisting of the genes of BRC Nos. 374-447;
  - b) detecting the biological activity of the polypeptide of step (a); and
  - c) selecting the test compound that suppresses the biological activity of the polypeptide

encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 374-398 as compared to the biological activity of said polypeptide detected in the absence of the test compound, or enhances the biological activity of the polypeptide encoded by the polynucleotide selected from the group consisting of the genes of BRC Nos. 399-447 as compared to the biological activity of said polypeptide detected in the absence of the test compound.

64. A method of screening for compound for treating or preventing invasion of breast cancer, said method comprising the steps of:

- a) contacting a candidate compound with a cell into which a vector, comprising the transcriptional regulatory region of one or more marker genes and a reporter gene that is expressed under the control of the transcriptional regulatory region, has been introduced, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 374-447;
- b) measuring the expression or activity of said reporter gene; and
- c) selecting the candidate compound that reduces the expression or activity of said reporter gene when said marker gene is an up-regulated marker gene selected from the group consisting of the genes of BRC Nos. 374-398, or that enhances the expression level of said reporter gene when said marker gene is a down-regulated marker gene selected from the group consisting of the genes of BRC Nos. 399-447, as compared to a control.

65. A method of treating or preventing invasion of breast cancer in a subject comprising administering to said subject an antisense composition, said antisense composition comprising a nucleotide sequence complementary to a coding sequence selected from the group consisting of the genes of BRC Nos. 374-398.

66. A method of treating or preventing invasion of breast cancer in a subject comprising administering to said subject an siRNA composition, wherein said siRNA composition reduces the expression of a nucleic acid sequence selected from the group consisting of the genes of BRC Nos. 374-398.

67. A method for treating or preventing invasion of breast cancer in a subject comprising the step of administering to said subject a pharmaceutically effective amount of an antibody, or fragment thereof, that binds to a protein encoded by a gene selected from

the group consisting of the genes of BRC Nos.374-398.

68. A method of treating or preventing invasion of breast cancer in a subject comprising administering to said subject a vaccine comprising (a) a polypeptide encoded by a nucleic acid selected from the group consisting of the genes of BRC Nos.374-398, (b) an immunologically active fragment of said polypeptide, or (c) a polynucleotide encoding said polypeptide.
69. A method for inducing an anti-tumor immunity against an invasion of breast cancer, said method comprising the step of contacting with an antigen presenting cell a polypeptide, a polynucleotide encoding the polypeptide or a vector comprising the polynucleotide, wherein the polypeptide is encoded by a gene selected from the group consisting of BRC No. 374-398, or the fragment thereof.
70. The method of claim 69, wherein the method further comprises the step of administering the antigen presenting cell to a subject.
71. A method of treating or preventing invasion of breast cancer in a subject comprising administering to said subject a compound that increases (a) the expression of a polynucleotide selected from the group consisting of the genes of BRC Nos. 399-447 or (b) the activity of a polypeptide encoded by said polynucleotide.
72. A method for treating or preventing invasion of breast cancer in a subject, said method comprising the step of administering a compound obtained by a method according to any one of claims 60-64.
73. A method of treating or preventing invasion of breast cancer in a subject comprising administering to said subject a pharmaceutically effective amount of an agent comprising (a) a polynucleotide selected from the group consisting of the genes of BRC Nos. 399-447, or (b) polypeptide encoded by said polynucleotide.
74. A composition for treating or preventing invasion of breast cancer, said composition comprising a pharmaceutically effective amount of an antisense polynucleotide or a small interfering RNA against a polynucleotide selected from the group consisting of the genes of BRC Nos.374-398.
75. A composition for treating or preventing invasion of breast cancer, said composition comprising a pharmaceutically effective amount of an antibody, or fragment thereof,

- 110 -

that binds to a protein encoded by a gene selected from the group consisting of the genes of BRC Nos.374-398.

76. A composition for treating or preventing invasion of breast cancer, said composition comprising as an active ingredient a pharmaceutically effective amount of a compound selected by a method of any one of claims 60-64, and a pharmaceutically acceptable carrier.

77. A method for predicting metastasis of breast cancer in a subject, the method comprising the steps of:

(a) detecting an expression level of one or more marker genes in a specimen collected from said subject, wherein the one or more marker genes are selected from the group consisting of the genes of BRC Nos. 719-752;

(b) comparing the expression level of the one or more marker genes in said specimen to that of a metastasis positive case and metastasis negative case; and

(c) wherein specimen expression level similar to that of a metastasis positive case indicates a high risk of metastasis of breast cancer, and wherein specimen expression level similar to that of a metastasis negative case indicates a low risk of metastasis of breast cancer.

78. The method of claim 77, wherein step (c) further comprises the steps of calculating a prediction score using the following steps:

i) calculating the magnitude of the vote ( $V_i$ ) by the following formula:

$$V_i = |x_i - (\mu_r + \mu_n) / 2|$$

wherein, in the formula,  $X_i$  is the expression level in the sample,  $\mu_r$  is the mean expression level in the metastasis negative cases, and  $\mu_n$  is the mean expression level in the metastasis positive cases,

ii) calculating PS values by following formula:

$$PS = ((V_r - V_n) / (V_r + V_n)) \times 100$$

wherein, in the formula,  $V_r$  and  $V_n$  are the total votes for metastasis negative case and metastasis positive case, respectively, and

iii) such that if the PS values is less than 15.8, the subject is determined to be at a high risk for having metastasis of breast cancer and wherein the PS values is more than 15.8, the risk for having metastasis of breast cancer is low.

79. A breast cancer reference expression profile, comprising a pattern of gene expression of two or more genes selected from the group consisting of the genes of BRC Nos. 719-752.
80. The expression profile of claim 79, wherein the gene expression is derived from a breast cancer cell of a patient with lymph-node metastasis or without lymph-node metastasis.
- 5 81. A kit comprising a detection reagent which binds to (a) two or more nucleic acid sequences selected from the group consisting of the genes of BRC Nos. 719-752, or (b) a polypeptide encoded by said gene.
82. An array comprising two or more nucleic acids which bind to one or more nucleic acid sequences selected from the group consisting of the genes of BRC Nos. 719-752.
- 10 83. A method of screening for a compound for treating breast cancer or preventing breast cancer metastasis, said method comprising the steps of:
- (1) contacting a test compound with a polypeptide encoded by a gene selected from the group consisting of genes of BRC Nos. 719-752;
- (2) detecting the binding activity between the polypeptide and the test compound; and
- 15 (3) selecting the test compound that binds to the polypeptide.
84. A method of screening for a compound for treating breast cancer or preventing breast cancer metastasis, said method comprising the steps of:
- (1) contacting a test compound with a polypeptide encoded by a gene selected from the group consisting of genes of BRC Nos. 719-752;
- 20 (2) detecting the biological activity of the polypeptide of step (a); and
- (3) selecting the test compound that reduces the biological activity of the polypeptide encoded by a gene selected from the group consisting of: VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1,
- 25 BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40 as compared to the biological activity detected in the absence of the test compound, or elevates the biological activity of the polypeptide encoded by a gene selected from the group consisting of: UBA52, GenBank Acc# AA634090, CEACAM3, C21orf97, KIAA1040, EEF1D, FUS, GenBank Acc# AW965200, and KIAA0475 as compared to the
- 30 biological activity detected in the absence of the test compound.
85. A method of screening for a compound for treating breast cancer or preventing metastasis

of breast cancer, said method comprising the steps of:

(1) contacting a test compound with a cell expressing one or more marker genes, wherein the marker genes are selected from the group consisting of genes of BRC Nos. 719-752; and

(2) selecting a compound that reduces the expression level of one or more of the marker genes selected from the group consisting of VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFGM, FLJ10726, DNAJB1, AP4S1, and MRPL40 as compared to the biological activity detected in the absence of the test compound, or elevates the expression level of one or more of the marker genes selected from the group consisting of UBA52, GenBank Acc# AA634090, CEACAM3, C21orf97, KIAA1040, EEF1D, FUS, GenBank Acc# AW965200, and KIAA0475 as compared to the biological activity detected in the absence of the test compound.

86. The method of claim 85, wherein said cell expressing one or more marker genes comprises a breast cancer cell.

87. A method of screening for a compound for treating breast cancer or preventing metastasis of breast cancer, said method comprising the steps of:

(1) constructing a vector comprising a transcriptional regulatory region of a gene selected from the group consisting of genes of BRC Nos. 719-752 and a reporter gene downstream and under the control of said transcriptional regulatory region;

(2) transforming a cell with the vector of step (1);

(3) contacting a test compound with the cell of step (2);

(4) detecting the expression or activity of the reporter gene; and

(5) selecting the test compound that reduces the expression or activity of said reporter gene when said marker gene is an up-regulated marker gene selected from the group consisting of VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFGM, FLJ10726, DNAJB1, AP4S1, and MRPL40, or that enhances the expression or activity of said reporter gene when said marker gene is a down-regulated marker gene selected from the group consisting

- 113 -

of UBA52, GenBank Acc# AA634090, CEACAM3, C21orf97, KIAA1040, EEF1D, FUS, GenBank Acc# AW965200, and KIAA0475, as compared to a control.

88. A method for treating breast cancer or preventing breast cancer metastasis in a subject, said method comprising the step of administering to the subject a pharmaceutically effective amount of a compound obtained by a method according to any one of claims 83-87.
89. A method for treating breast cancer or preventing breast cancer metastasis in a subject, said method comprising the step of administering to the subject a pharmaceutically effective amount of an antisense nucleic acid or siRNA against one or more genes selected from the group consisting of VAMP3, MGC11257, GSPT1, DNMT2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40.
90. A method for treating breast cancer or preventing breast cancer metastasis in a subject, said method comprising the step of administering to the subject a pharmaceutically effective amount of an antibody or fragment thereof that binds to a protein encoded by a gene selected from the group consisting of VAMP3, MGC11257, GSPT1, DNMT2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40.
91. A method for treating breast cancer or preventing breast cancer metastasis in a subject, said method comprising the step of administering to the subject a pharmaceutically effective amount of a polypeptide, polynucleotide encoding said polypeptide or a vector comprising said polynucleotide, wherein the polypeptide is encoded by a gene selected from the group consisting of UBA52, GenBank Acc# AA634090, CEACAM3, C21orf97, KIAA1040, EEF1D, FUS, GenBank Acc# AW965200, and KIAA0475, or a fragment thereof.
92. A method for inducing anti-tumor immunity, said method comprising the step of contacting an antigen presenting cell with a polypeptide, a polynucleotide encoding said polypeptide or a vector comprising said polynucleotide, wherein the polypeptide is encoded by a gene selected from the group consisting of VAMP3, MGC11257, GSPT1, DNMT2,

- 114 -

CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40, or a fragment thereof.

93. The method for inducing an anti-tumor immunity of claim 92, wherein the method further  
5 comprises the step of administering the antigen presenting cell to a subject.

94. A composition for treating breast cancer or preventing breast cancer metastasis in a subject, said composition comprising a pharmaceutically effective amount of a compound obtained by a method according to any one of claims 83-87.

95. A composition for treating breast cancer or preventing breast cancer metastasis in a subject,  
10 said composition comprising a pharmaceutically effective amount of an antisense nucleic acid or siRNA against one or more genes selected from the group consisting of VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40.

15 96. A composition for treating breast cancer or preventing breast cancer metastasis in a subject, said composition comprising a pharmaceutically effective amount of an antibody, or fragment thereof, that binds to a protein encoded by a gene selected from the group consisting of VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255,  
20 DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40.

97. A composition for treating breast cancer or preventing breast cancer metastasis in a subject, said composition comprising a pharmaceutically effective amount of (a) a polypeptide, (b) a polynucleotide encoding said polypeptide or (c) a vector comprising said polynucleotide, wherein the polypeptide is encoded by a gene selected from the group consisting of  
25 VAMP3, MGC11257, GSPT1, DNM2, CFL1, CLNS1A, SENP2, NDUFS3, NOP5/NOP58, PSMD13, SUOX, HRB2, LOC154467, THTPA, ZRF1, LOC51255, DEAF1, NEU1, UGCGL1, BRAF, TUFM, FLJ10726, DNAJB1, AP4S1, and MRPL40, or a fragment thereof.